RESEARCH ARTICLE | International Journal of Plant Sciences, Vol. 4 Issue 1 : 94-97 (January to June, 2009)

Germination of encapsulated synthetic seeds from *Glossocardia bosvallea*

R. GEETHA AND G.V. GOPAL

Accepted : October, 2008

SUMMARY

Embryogenic callus was induced on the leaves of *Glossocardia bosvallea*, a medicinal plant on Murashige and skoog's medium supplemented with 6-Benzyl amino purine (1.75mg/l)+Naphthalene acetic acid (NAA) (1mg/l). The harvested embryoids were encapsulated using different percentage of alginate (1.5-3.5%) and the best result was obtained in 2.5% sodium alginate. Highest frequency of germination of embryoids was obtained on MS basal medium. Germination was nil in synthetic seed encapsulated with 1.5% and 3.5% of sodium alginate. Encapsulated synthetic seeds showed about 67 per cent germination. Storage of capsule beyond 25 days destroyed the viability of the encapsulated embryos and the germination was nil from the capsules that was stored for 30 days. Of the two media tested for germination, MS media was proved to be the best. The frequency of germination of synthetic seeds in MS media was significantly higher than that of synthetic seeds cultured on nitsch media. Germinated artificial seeds with well-developed shoot and roots were transferred successfully to greenhouse. This is the first report on synthetic seeds in *Glossocardia bosvallea*.

Key words : *Glossocardia bosvallea*, *In vitro* storage, Medicinal plant, Tissue culture, Synthetic seeds.

Glossocardia bosvallea, a member of Asteraceae family is an annual herb that grows in all plain districts, in sandy places and in dry parts of the country. The plants are 2.5-5cm long, pinnatisect, with solitary heterogamous head, Florets yellow, bisexual (Shaw, 1978). The plant is an emmenogogue, diaphoretic. The decoction is useful in treating fever and the ailments of uterus in women. It is also eaten as a vegetable in times of scarcity. Traditional healers use the decoction of roots of this plant to wash vagina for curing leucorrhoea. The roots collected before flowering is considered best on treatment of dysmenorohea. The whole herb in powdered form is added in popular herbal combinations. Synthetic seeds can be stored in a small volume. This helps to preserve germplasm, which in turn plays an important role in the maintenance of biodiversity. Redenbaugh *et al.* (1991) suggested that, it is possible to produce asexual embryos *in vitro.*

Synthetic seed technology is one of the important applications of somatic embryogenesis. In these synthetic seed system, somatic embryo is encapsulated in protective alginate matrix, which provides mechanical support (Redenbaugh, 1986). Encapsulation technique is important application for *in vitro* storage of somatic embryos. The size of synthetic seed and the coating around the somatic embryos are potentially advantageous for storage, handling, transportation and planting (Redenbaugh *et al.*, 1991). There are many studies on encapsulation of different plant material. Somatic embryos were used as a reproducible system like for sugarcane (Nieves *et al.*, 2003), *Paulownia elogata* (Ipekci and Ozukirmizi, 2003), groundnut (Padmaja *et al.*, 1995). Encapsulation is also done successfully on non embryogenic vegetative propagules such as nodal segment, axillary bud (Mathur *et al.*, 1989) shoot buds (Thiem, 2002) hairy roots (Repunte *et al.*, 1995) or callus. So far, very few attempts have been made to develop synthetic seeds in medicinal plants. Hence, in the present paper, it is report a protocol for synthetic seeds, their storage and propagation in *Glossocardia bosvallea*, an important medicinal plant, the medicinal value of which is stated earlier. The work undertaken may prove useful in pharmaceutical industries.

Correspondence to:
R. GEETHA, Botany Section, Regional Institute of Education, MYSORE (KARNATAKA) INDIA
Authors' affiliations:
G.V. GOPAL, Botany Section, Regional Institute of Education, MYSORE (KARNATAKA) INDIA

MATERIALS AND METHODS

Leaves as explants were procured from field grown plants of *Glossocardia bosvallea* from Regional Institute of Education Campus. Explants were washed thoroughly under running tap water washed with 5% teepol for 10 minutes. Surface sterilization was done with mercuric chloride (0.1%) for 5-7 minutes and then washed thoroughly with autoclaved double distilled water. The pH of the medium was adjusted to 5.6-5.8 before adding agar agar and autoclaved at121^{0}C at 105 Kpa for 20 min. Cultures were maintained at 25^{0}C ± 2^{0}C with light intensity of 50µ mol $m^{-2}s^{-1}$. MS medium containing 3 per cent sucrose and 0.8% agar with different concentration of growth regulators (BAP, NAA 2-4 D) either alone or in combination was tested for callus induction. The callus